DEL'TSOV; B.M., inzh.; SHCHERBINA, E.G., inzh.

Trends in the creation of means for the mechanization of stoping operations in steeply dipping seams. Ugol' Ukr. 6 no.5:32-33 My '62.
(MIRA 15:11)

1. Gorlovskiy mashinostroitel'nyy zavod im. S.M.Kirova (for Del'tsov).
2. Toretskiy mashinostroitel'nyy zavod (for Shcherbina).
(Donets Basin--Coal mining machinery)

ACC NR: AP7000736

KNUNYANTS, I. L., KRASUSKAYA, M. P., DEL'TSOVA, D. P., Institute of Hetero-organic Compounds, Academy of Sciences USSR (Institut elementoorganicheskikh soyedineniy AN SSSR)

SOURCE CODE: UR/0062/66/000/006/1110/1111

"Perfluorodiisocyanates"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Khimicheskaya, No 6, 1966, pp 1110-1111

Abstract: Perfluorodiisocyanates $OCN(CF_2)_nNCO$ (n = 3, 4, 8) were produced by reactions of perfluorodicarboxylic acid hydrazides with nitrous acid or perfluorocarboxylic acid chlorides with sodium azide, followed by rearrangement of these acid azides formed under the conditions of the Curtius reaction. Perfluoropolymethylenediisocyanates react vigorously with alcohols, to give the corresponding perfluoropolymethylenediurethans. Orig. art. has: 2 formulas. [JPRS: 37,023]

TOPIC TAGS: organic cyanate compound, fluorinated organic compound, azide

SUB CODE: 07 / SUBM DATE: 10Dec65 / ORIG REF: 001 / OTH REF: 002

Card 1/1

UDC: 542.91 + 547.239 + 546.1

USSR/Electricity - Boilers

Jun 50

"Two-Stage Evaporation and Steam Separation in a TKP-3 Type Boiler," O. L. Del'va, N. F. Rysakov, Engineers

"Elek Stants" No 6, pp 48-50

Describes experiments which prove it practical to convert TKP-3 type boiler to two-stage evaporation system. Reconstructed boiler can be operated at maximum load of 190/200 tons/hr, with boiler water salt content of 4,500 mg/l. Diagrams and graphs show operating characteristics of boiler at maximum and normal loads.

162T7

DEL'VA, V. A:

DEL'VA, V. A.:   "The content of copper in the spinal fluid and blood serum in
                     certain diseases of the nervous system." Khar'kov State Medical
                     Inst. Stalino, 1956. (DISSERTATION For the Degree of Candidate
                     in Medical Science.)

So: Knizhnaya Letopis', No. 18, 1956.

The detection of microelements in the cerebrospinal fluid of man. V. A. Del'va. Zhur. Nevropatol. i Psikhiatri im. Korsakova. 56, 888-9(1956).—This is a continuation of the work of Dorfman and Shipitsin (Byull. Eksptl. Biol. i Med. 1951, 7, 250-60) who showed by spectral analysis that the number of microelements in the spinal fluid is large. Analyses were made of the cerebrospinal fluid (I) of normal and sick persons. Five ml. of I were evaporated to dryness and the residue ashed. Since a min. of 1.5 g. of the ash was required for a complete single analysis, samples of I from 20-25 persons were combined for one analysis. The heavy metals were extd. from the ash with chloroform and a soln. of dithizone, a procedure which increased the metal concn. 20-fold. Results of spectrophotometric analyses are presented as follows (symbol of the metal; 3, 2 and in some cases just 1 wave length value in A; + +, +, or ±, which indicates the intensity of the spectral lines): Al, 2575.1, 3082.2, 3944.0 + +; Si, 2506.9, 2516.1, 2881.0, + +; Ti, 2958.1, 3234.5, 3372.8, + +; Fe, 2500.3, 3020.6, 3581.°, + +; Cu, 2618.4, 3247.5, 3273.9, + +; Mn, 2576.1, 2794.8, 2801.0, +; Co, 3044.0, 3405.1, 3453.5, +; Ni, 3050.8, 3414.7, 3458.5, +; Pb, 25—3, 2802.0, 2833.0, +; Zn, 3035.8, 3345.0, 4810.6, +; Sn, 2840.0, 3175.0, +; Be, 2348.6, 3130.4, +; Bi, 2898.6, 3067.7, +; Cr, 2843.2, 4254.3, ±; Mo, 3132.6, 3170.3, ±; V, 3183.4, 3183.9, 3185.3, ±; Ba, 4554.0, ±; Sr, 4607.3, ±; Ge, 2651.5, ±; Cd, 2283.6, 3261, ±. The highest intensity was noted for Al, Si, Fe, Ti, and Cu, and the lowest for Mn, Co, Ni, Pb, Sn, Zn, and weak for the other metals. On the assumption that the intensity of

Del've, V.A.

the spectral lines is proportional to the quantity of the element present in I, the metals are arranged in the following quantitatively descending order: Si, Al, Fe, Ti, Cu. The quantity of all other metals in I was comparatively low. The intensity of the spectral lines of Si, Al, Fe, Ti, and Cu of neurologically normal persons was of a lesser magnitude than in I of patients with neurologic conditions.

B. S. Levine

USSR / General Problems of Pathology. Pathophysiology U
    of Infection.

Abs Jour: Ref Zhur-Biol., No 9, 1958, 41940.

Author : Del'va, V. A.
*Inst   : Not given.
Title   : The Copper Content of the Cerbrospinal Fluid and
    Blood Serum in Acute Infections of the N.S.

Orig Pub: Zh. nevropatol. i psikhiatrii, 1957, 57, No 5,
    619-623.

Abstract: In healthy subjects the Cu value in the blood
    serum is 24.6 mg% in the CSF 0.49 mg%. It was
    observed that the Cu concentration in neuroviral
    diseases increases in the CSF and decreases in
    the serum.

        * Klinika nervnykh bolezney i kafedra biokhimii
          Stalinskogo meditsinskogo instituta imeni A. M. Gorikogo

Card 1/1

                        18

DEL'VA, V.A.; SEMENYUK, I.F.

Observations on osteopetrosis with symptoms of intracranial
hypertension. Vop.neirokhir. 22 no.6:50-51 N-D '58.

(MIRA 12:2)

1. Stalinskiy meditsinskiy institut imeni A.M. Gor'kogo.
            (CEREBROSPINAL FLUID,
                  hypertension, intracranial, in osteopetrosis (Rus))
            (OSTEOPETROSIS, compl.
                  intracranial hypertension (Rus))

DEL'VA, V.A., kand.med.nauk

Diagnosis of uncomplicated stagnant papillae of the optic nerves.
Vrach.delo no.10:1083 O '59.   (MIRA 13:2)

1. Poliklinicheskoye otdeleniye TSentral'noy klinicheskoy bol'nitsy
g. Stalino.
                   (OPTIC NERVE--DISEASES)

MEL'NIKOV, P.P., kand.med.nauk; DEL'VA, V.A., kand.med.nauk (Stalino)

Meningeal syndrome in brain tumors. Vrach.delo no.11:1201 N '59.
(MIRA 13:4)

1. Klinika infektsionnykh bolezney (zaveduyushchiy – dotsent S.L.
Erez) klinicheskoy bol'nitsy imeni Voroshilova.
(BRAIN--TUMORS)

GETMANETS, V.N.; PARKHOMOV, I.I.; DEL'VA, V.A.

Case of actinomycosis with injury of the central nervous system.
Vrach.delo   no.1:83-84 '60.   (MIRA 13:6)

1. Kafedra patologicheskoy anatomii (zav. - dotsent Ye.A. Dik-
shteyn) kafedra infektsionnykh bolezney (zav. - dotsent S.A.
Yerez) i kafedra nervnykh bolezney (zav. - prof. P.A. Miniovich)
Stalinskogo meditsinskogo instituta.
        (ACTINOMYCOSIS)   (NERVOUS SYSTEM--DISEASES)

GARINA, Yu.G.; DEL'VA, V.A.

Case of multiple spongioblastoma multiforme of the brain. Vrach.
delo no. 3:120 Mr '60.   (MIRA 14:4)

1. Klinika nervnykh bolezney (zav. - prof. P.A. Miniovich)
Stalinskogo meditsinskogo instituta imeni A.M. Gor'kogo.
                    (BRAIN—TUMORS)

VOYNAR, A.O.} DEL'VA, V.A.

Some results and objectives for further research on trace elements
in medicine in the light of the decision of the coordinating committee
on the problem "Biological role of the trace elements." Vop.med.
khim. 6 no.4:439-441 Jl-Ag '60.   (MIRA 14:3)
                        (TRACE ELEMENTS)

DEL'VA, V.A.

Chemical asymmetry of the subcortical nodes and cerebral
cortex in man. Zhur.nevr.i psikh. 60 no.1:26-28 '60.

(MIRA 13:5)

1. Stalinskiy meditsinskiy institut imeni A.M. Gor'kogo.
        (BRAIN chem.)

DEL'VA, V.A., kand.med.nauk

Chemical topography of aluminum in the human cerebral cortex in relation
to its cytoarchitectonics. Vrach. delo no.10:113-116 O '61.
(MIRA 14:12)

1. Stalinskiy meditsinskiy institut imeni A.M.Gor'kogo.
(ALUMINUM IN THE BODY)   (CEREBRAL CORTEX)

DEL'VA, V.A.

Amount of manganese in various segments of the human cerebral cortex.
Vop. med. khim. 7 no.5:465-468 S-O '61.   (MIRA 14:10)

1. The A.M.Gorki Medical Institute, Stalino.
        (MANGANESE IN THE BODY)   (CEREBRAL CORTEX)

DEL'VA, V.A., kand.med.nauk

Problems in the spectral analysis of biological materials at the Ukrainian conference on physical optics and its use in the national economy. Vop. med. khim. 7 no.5:552-553 S-O '61.   (MIRA 14:10)
    (OPTICS, PHYSICAL)   (BIOLOGICAL PRODUCTS—SPECTRA)

DEL'VA, V.A.

Absorption spectrophotometry of human spinal fluid in the ultra-
violet part of the spectrum. Report No.2: Absorption curves of
spinal fluid containing an increased quantity of protein. Zhur.
nevr. i psikh. 61 no.9:1290-1293 '61.   (MIRA 14:9)

1. Klinika nervnykh bolezney (zav. kafedroy - prof. P.A.Miniovich)
Stalinskogo meditsinskcgo instituta imeni A.M.Gor'kogo.
          (CEREBROSPINAL FLUID)   (PROTEINS)
               (SPECTROPHOTOMETRY)

DEL'VA, V.A.

Silicon content in human cerebral cortex. Biul. eksp. biol. i med.
52 no.8:59-62 Ag '61.   (MIRA 15:1)

1. Iz Stalinskogo meditsinskogo instituta imeni A.M.Gor'kogo,
Donbass. Predstavlena deystvitel'nym chlenom AMN SSSR S.Ye.
Severinym. (CEREBRAL CORTEX)   (SILICON IN THE BODY)

DEL'VA, V.A.

Absorption spectroscopy of human cerebrospinal fluid in the ultra-
violet spectrum. Zhur. nevr. i psikh. 61 no.6:829-832 '61.
(MIRA 15:2)

1. Klinika nervnykh bolezney (zav. - prof. P.A. Miniovich) Stalinskogo
meditsinskogo instituta.
(CEREBROSPINAL FLUID)   (SPECTRUM ANALYSIS)

DEL'VA, V.A. [Del'va, V.O.]

Spectrum analysis of biological materials. Ukr.fiz.zhur. 6 no.6:
834-837 N-D '61.   (MIRA 16:5)

1. Gosudarstvennyy meditsinskiy institut im. Gor'kogo, Donetsk.
         (Biological research)   (Spectrum analysis)

DEL'VA, V.A.

Copper content in different cytoarchitectonic areas of the
cerebral cortex in man. Zhur. nevr. 1 psikh. 61 no.12:1785-
1788 '61.   (MIRA 15:7)

1. Donetskiy meditsinskiy institut imeni A.M. Gor'kogo (dir. -
dotsent A.M. Ganichkin), Donbass.
             (COPPER IN THE BODY)   (CEREBRAL CORTEX)

DEL'VA, V.A.

Amount of silicon in various formations of the human brain.
Biul. eksp. biol. i med. 54. no.12:50-52 D'62. (MIRA 16:6)

1. Iz Donetskogo meditsinskogo instituta imeni A.M.Gor'kogo
Predstavlena deystvitel'nym chlenom AMN SSSR A.V.Lebedinskim.
        (BRAIN) (SILICON)

DEL'VA, V.A., kand. med. nauk

Change in the spectral properties of the cerebrospinal fluid
in brain tumors. Vop. neirokhir. 27 no.5:53-54 S-O '63.
(MIRA 17:5)

1. Donetskiy meditsinskiy institut imeni Gor'kogo.

DEL'VA, V.A.

Spectral characteristics of fractions of hydrosoluble proteins of the human brain. Zhur. nevr. i psikr. 64 no.9:1345-1347 '64.
(MIRA 17:12)

1. Donetskiy meditsinskiy institut im. A.M. Gor'kogo.

DELIVA, V.A.

Conference on the problem 'Biological role of trace elements".
Vop. med. khim. 8 no.4:437-439 Jl-Ag '62.

(MIRA 17:11)

DEL'VA, V.A.; KOVTUNYAK, N.A.

Scientific conference on the problem of "The biological role of trace elements." Vop. med. khim. 9 no.6:649-650 N-D '63.

(MIRA 17:10)

BAKSHINSKAYA, R.Ye.; BELOVA, V.A.

Diagnosis of epilepsy in medico-legal practice; preliminary report.
Sud.-med. eksport. 7 no.3:38-41 Jl-S '64.

(MIRA 17:10)

1. Kafedra sudebnoy meditsiny (zav.- dotsent B.N. Zorin) i kafedra
nervnykh bolezney (zav. - prof. P.A. Mintsvich) Donetskogo medi-
tsinskogo instituta.

L 06568-67   EWP(m)/EWT(1)/EWT(m)/EWP(t)/ETI   IJP(c)   WW/JD/JG

ACC NR: AP6029784   SOURCE CODE: UR/0294/66/004/004/0595/0597

AUTHOR: Kokorev, L. S. (Moscow); Petrovichev, V. I. (Moscow); Del'vin, N. N. (Moscow)

ORG: None

TITLE: Use of the continuous heating method for studying heat exchange during flow of mercury in a tube

SOURCE: Teplofizika vysokikh temperatur, v. 4, no. 4, 1966, 595-597

TOPIC TAGS: thermodynamics, mercury, heat transfer fluid

ABSTRACT: A previously proposed method (L. S. Kokorev, V. I. Petrovichev, PMTS, No 1, 1961) for measuring the coefficient of heat exchange during turbulent flow of water in a channel with close to quasistationary continuous heating conditions is used for studying heat exchange of mercury under continuous heating or cooling conditions. The Nusselt number for a given cross section is determined from the formula

$$Nu = \frac{d}{4l} \cdot \frac{Pe}{\theta_t - \theta_f - \Delta\theta_w}$$

where d is the inside diameter of the tube, l is the length of the experimental section, θ_t is the experimentally determined temperature of the wall at a fixed distance

UDC: 536.24

Card 1/2

I. 06568-67

ACC NR: AP6029784

from the input to the tube where the thermocouple is fastened, θ_f is the temperature of the fluid, $\Delta\theta_w$ is the temperature drop in the wall at the point where the thermocouple is fastened and Pe is the Péclet number. Experiments are conducted for determining the coefficient of heat exchange to mercury with continuous heating or cooling of the fluid at the input in an experimental low-carbon steel cylinder 450 mm long with an inside diameter of 8.0 mm and an outside diameter of 60 mm. The wall temperature was measured by thermocouples placed 225 and 405 mm from the input. The results agree satisfactorily with the formula given by Subbotin (V. I. Subbotin et al., *Atomnaya energiya*, 13, No 4, 1962): $Nu=5+0.025\,Pe^{0.8}$. Analysis indicates that the theoretical relationships derived for quasistationary conditions may be used for the more general case of continuous heating or cooling of the heat-transfer agent during flow in a tube. Orig. art. has: 2 figures, 6 formulas.

SUB CODE: 20/ SUBM DATE: 21Apr65/ ORIG REF: 002

Liquid Metal 18

Card 2/2

TITE, Piro, dr; DELVINA, Dragush, dr.

A case of staphylococcal meningitis in bilateral acute
mastitis and streptomycin allergy. Shendet pop 6
14-19 '62.
        (STREPTOMYCIN TOXICOLOGY) (DRUG ALLERGY)
            (MENINGITIS) (STAPHYLOCCOCAL INFECTIONS)
                       (MASTITIS)

DEL'VING G.N.

Collected Papers (Cont.)   SOV/4172

Radchenko, A.N. New Way of Coding Digital Meter Readings Using the Method
of Partially Unbalancing the Counter   251
    The author investigates a method of readout by means of binary codes with
    consecutive pulse sequences from the counter of a follow-up digital meter.

Radchenko, A.N., and V.I. Filippov. Logical Feedbacks in Shift Registers   257
    The authors explain the design of shift-register counting circuits, and
    calculate feedback circuits with an interconversion factor of 10, for
    20-state counter circuits, and for the readout of 127 seven-digit binary
    codes. They stress the advantages of logical feedback systems over the
    usual binary stage circuits.

Del'ving, G.N. Designing a Static Power Converter Using Elements With
Rectangular Hysteresis Loops   267
    The author examines the possibility of designing a static power converter
    based on the principle of time-amplitude modulation and making use of ele-
    ments with rectangular hysteresis loops. He concludes that this could be
    achieved after further theoretical and experimental investigations.

Sbornik rabot po voprosam elektormekhaniki vyp. 3: Energeticheskiye sistemy,
elektromashinostroyeniye, elektricheskaya tyaga, avtomatizirovannyy elektroprivod,
avtomaticheskiye i telemekhanicheskiye sistemy, elektrosvarochnoye oborudovaniye,
Moscow, Izd-vo AN SSSR, 1960,   314p.
publ. from Akad. nauk SSSR,   Inst. elektromekhaniki

Static power transducers

S/194/62/000/004/008/105
D222/D309

netic devices. carborundum resistances). 2. Converters using the
linear part of the characteristic of the multiplier element. The
latter may be a bismuth helix heater-type resistor, the Hall ef-
fect. 3. Converters using elements with hyperbolic characterist-
ics (magnetic amplifiers, where the supply voltage is proportion-
al to the measured voltage, and the control current to the mea-
sured current). Converters based on elements with a rectangular
hysteresis loop work on the principle of time-amplitude modula-
tion in which the width and amplitude of the input pulse is de-
pendent on the measured current and voltage. Some circuits are
given as examples. 5 figures. 32 references. /⁻Abstracter's note:
Complete translation._7

Card 2/2

DEL'VING, K., SOKOLOV, V.

Bookkeeping

Ledger form. Bukhg. uchet. 11, no. 3, 1952

Monthly List of Russian Accessions, Library of Congress, June 1952. Unclassified.

DEL'VING, Konstantin Yur'yevich; SOKOLOV, Vyacheslav Dmitrievich; POPOV, A.V., redaktor; MADRISH, D.M., tekhnicheskiy redaktor.

[Accounting for stores] Uchet i otchetnost' magazina. Moskva, Gos.izd -va torgovoi lit-ry, 1955. 143 p.   (MLRA 9:4)
                                    (Accounting)

DEL'VING, Konstantin Yur'yevich; SOKOLOV, Vyacheslav Dmitriyevich; STAR-
CHIKOVA, I.I., red.; MAMONTOVA, N.N., tekhn. red.

[Store's accountings and reports] Uchet i otchetnost' magazina.
Moskva, Gos. izd-vo torg. lit-ry, 1961. 198 p.   (MIRA 14:8)
(Retail trade—Accounting)

DELY ESTERA

RUMANIA/Nuclear Physics - Instruments and Installations   C-2
            Methods of Measurement and Investigation.

Abs Jour : Referat Zhur - Fizika, No 1, 1958, 306

Author   : Szabo, Arpad., Dely Estera; Szabo, Ana;
Inst   : -
Title   : Preparation of Standard Solutions of Ra from Raw Material
             Available in the Rumanian People's Republic.

Orig Pub : Comun. Acad. RPR, 1956, 6, No 10, 1187-1192

Abstract : A standard solution was prepared from limestone deposits
             of mineral waters, containing metallic radium. Barium
             was used as the carrier for the element radium. The se-
             paration of radium was by precipitation in the form of
             chromate. Solutions of radium are suitable both for the
             preparation of standards and for various scientific re-
             search projects.

Card 1/1

DELY, O.; GOZMANY, L.; HORVATH, L.

Results of the zoological collecting trip to Egypt in 1957, of the Natural History Museum, Budapest. Pt. I. Preliminary Report. In English. p. 131.

Orszagos Magyar Termeszettudomanyi Muzeum. MAGYAR NEMZETO MUZEUM TERMESZET-TUDOMANYI MUZEUM EVKONVYE. ANNALES HISTORICO-NATURALES MUSEI NATIONALIS HUNGARICI. Budapest, Hungary. Vol. 9, 1958

Monthly list of East European Accessions (EEAI) LC, Vol. 9, no. 2, Feb. 1960

Uncl

DELY, O.G.   (Budapest, VIII., Baross. u. 13)

Contribution to taxonomic, zoogeographic and genetic studies
on Rana Arvalis Nilss. and Rana Arvalis Wolterstorfii Fejerv.
Acta zool. Hung 10 no.3/4:309-361 '64

1. Section Zoologique du Musee Hongrois d'Histoire Naturelle,
Budapest (Directeur: Dr. Z.Kaszab).

DELY, Zoltan, fooloado

Report on the conferences on town history Stat szemle 42
no.5:536-539 My '64.

1. Central Statistical Office, Budapest.

DELYAGIN, G. N.: Master Tech Sci (diss) -- "Investigation of combustion and heat exchange in the burning of liquid fuel in an eddying air stream under pressure". Moscow, 1959. 16 pp (Acad Sci USSR, Inst of Mineral Fuels), 150 copies (KL, No 13, 1959, 104)

DELYAGIN, G. N.   24-8-21/34

AUTHORS: Delyagin, G.N., Ivanov, V.M. and Kantorovich, B.V. (Moscow).

TITLE: On the application of solid processed fuel in gas turbines. (O primenenii tverdogo formovannogo topliva v gazoturbinnykh ustanovkakh).

PERIODICAL: "Izvestiya Akademii Nauk, Otdeleniye Tekhnicheskikh Nauk" (Bulletin of the Ac.Sc., Technical Sciences Section), 1957, No.8, pp.134-137 (U.S.S.R.)

ABSTRACT: Use of solid fuel in gas turbines would be facilitated by a process of "pyrogenetic" breaking down of gas and weakly coking coal proposed by L. M. Sapozhnikov (3), since it enables obtaining strong fuel of any desired dimensions and shape with a porosity of 40 to 50%. The process consists of crushing the coal to sizes of between 0 and 3 mm, feeding the powder in a vortex chamber where it is heated by means of hot gases for 0.5 to 2 secs to a temperature corresponding to the plastic state, i.e. 380 to 450 C and subsequently shaping the thus obtained mass into bits of suitable shape and dimension by applying a pressure of 2 to 5 kg/cm^2. It is claimed that high quality fuel can be obtained by this process and that the obtained fuel is more suitable for gas turbines than otherwise processed fuel. Another method which is at present being tested by the Institute of Mined Fuels Ac.Sc. (Institut Goryuchikh Iskopayemykh AN SSSR) is the production by the above mentioned process of a

Card 1/2

KANTOROVICH, B.V.; DELYAGIN, G.N.

Investigating the combustion process of pyrogenic pelletized fuel.
Trudy IGI 10:206-209 '59.   (MIRA 12:12)
    (Briquets (Fuel)--Testing))   (Combustion)

Delyagin, G. N.

PHASE I BOOK EXPLOITATION   SOV/5731

Akademiya nauk SSSR. Institut goryuchikh iskopayemykh

Gazifikatsiya i goreniye topliva (Fuel Gasification and Combustion) Moscow, Izd-vo AN SSSR, 1959. 227 p. (Series: Ikh Trudy, Vol 11) Errata slip inserted. 1,600 copies printed.

Ed.: E. V. Lavrov; Ed. of Publishing House: V. S. Pokrovskiy; Tech. Ed.: L. M. Daretkina.

PURPOSE: This collection of articles is intended for scientific research workers and engineers studying combustion processes and solid fuel gasification.

COVERAGE: This collection concerns the theoretical and experimental study of the mechanism of chemical reactions occurring in combustion and gasification. Results of the isotopic method of studying the gas generating process and its reactions, and the reaction of carbon monoxide and heated coal are analyzed and the pilot plants used in this study are described. Reactions of coal combustion, coal oxidation, methane dissociation and conversion are discussed and their equilibrium constants given in tables. The processes of methane oxidation by oxygen and synthesis-gas production by oxidizing natural gas with the subsequent reduction of oxidation products by carbon are analyzed as is the effect of an excessive amount of air on the burning process of powdered solid fuel. The utilization of heavy petroleum residue and tar for combustion and gasification purposes is also discussed along with the principle of fluidization. Analysis, grading control and intensification of physical and chemical processes by means of ultrasonic vibrations are also covered. No personalities are mentioned. References accompany all but the first article.

TABLE OF CONTENTS:

DELYAGIN, G.N.

   "Heat Transfer by Convection in a Vortex Gas Flow."

Report submitted for the Conference on Heat and Mass Transfer,
Minsk, BSSR, June 1961.

DELYAGIN, G.N.; KANTOROVICH, B.V.; ATENKOV, S., tekhn. red.

[Mass transfer in the combustion of fuel in fluid flow;
Conference on Heat and Mass Transfer, Minsk, January 23-27, 1961]
Massoobmen v protsesse goreniia topliva v potoke; soveshchanie po
teplo-i massoobmenu, g. Minsk, 23-27 ianvaria 1961 g. Minsk, 1961.
20 p.   (MIRA 15:2)
    (Combustion) (Fuel)   (Mass transfer)

AID Nr. 992-13   18 June

MASS TRANSFER DURING COMBUSTION OF FUEL IN FLOW (USSR)

N.

Delyagin, G. É., and B. V. Kantorovich. IN: Teplo- i massoperenos, tom II: Teplo- i massoperenos pri fazovykh i khimicheskikh prevrashcheniyakh (Heat and mass transfer, v. 2: Heat and mass transfer during phase and chemical transformations). Minsk, Izd-vo AN BSSR, 1962, 249-259.

S/862/62/002/000/026/029

A complex analysis of liquid fuel combustion in an oxidizer stream was made on the basis of a quasi-heterogeneous combustion model which was formulated for solid, liquid, and gaseous fuels. Equations for the rate of combustion, the overall conservation of mass, the conservation of oxygen, the conservation of energy, an equation for the evaporation process, and the equation of state were formulated for an infinitesimal control volume with allowance for non-isothermicity along the combustion chamber. The equations were solved for two cases: 1) instantaneous fuel evaporation prior to combustion; and 2) combustion taking place simultaneously with evaporation where a) evaporation is controlled by the amount of heat evolved in combustion, or b) the amount of evaporated fuel equals the amount of burned fuel. Three resulting equations

Card 1/2

AID Nr. 992-13   18 June

MASS TRANSFER DURING COMBUSTION OF FUEL [Cont'd]   S/862/62/002/000/026/029

were obtained which express the effect of excess air, fuel-consumption rate, and pressure on the combustion rate. The equations were verified by experiments in water-cooled cylindrical combustion chambers 214 and 185 mm in diameter in which kerosene or diesel fuel was burned in air at a fuel-consumption rate of 19.7 to 42 kg/hr and an excess air coefficient of 1 to 1.82. The discrepancy between theoretical and experimental data amounted to 10-12% at a fuel combustion of 50% and to 2% at a combustion of 80%. The equations were also applied to experimental data obtained previously by P. I. Isarenko, who studied the combustion of natural gas in a combustion chamber 1720 mm long and 325 mm in diameter at a fuel-consumption rate of 0.73 to 3 kg/hr. The results showed that the effect of operating variables on the intensity of combustion is analogous for both gaseous and liquid fuels. An increase in fuel-consumption rate decreases the combustion intensity, and an increase in excess air increases the intensity up to a given limit. The pressure has no effect under the conditions studied. The results confirm that combustion of gaseous and sprayed liquid fuel in an oxidizer stream is controlled by the mass-transfer rate rather than by the chemical-reaction rate. The study was made at the Institute of Mineral Fuels, Academy of Sciences USSR.

[PV]

Card 2/2

DELYAGIN, G.N.

Effect of an air vortex in a gas stream on the heat exchange in
a combustion chamber. Trudy IGI 12:181-189 '61. (MIRA 14:3)
(Gas flow) (Heat—Transmission)

DELYAGIN, G.N.; KANTOROVICH, B.V.

Mass and heat transfer in the process of combustion in an air stream.
Trudy IGI 19:10-23 '62.
(Fuel)   (Mass transfer)   (MIRA 16:4)
                                         (Combustion)

DELYAGIN, G.N.

Heat convection in a whirling air flow under pressure. Trudy IGT 19:24-34
'62.
     (Heat—Convection)   (Air flow)   (MIRA 16:4)

S/846/62/019/000/006/008
E071/E151

AUTHORS: Delyagin, G.N., Ivanov, V.M., and Kantorovich, B.V.

TITLE: The effective utilisation of fuels together with water

SOURCE: Akademiya nauk SSSR. Institut goryuchikh iskopayemykh.
              Trudy. v.19. 1962. Novyye metody szhiganiya topliv i
              voprosy teorii goreniya. 59-65

TEXT: This is a survey of work of the Institute and
associated organisations on the efficient utilisation of fuels with
a high moisture content. The hydro-transportation of coal is
associated with an increase in the amount of coal slurries, which
require the development of efficient methods for their combustion.
Nearly all high viscosity fuel oils are also of high moisture
content. Various methods of preparation of oil-water emulsions
and their combustion have been investigated. As an example, the
disposal is quoted of an effluent containing toxic organic
substances, which was incorporated into fuel oil (10-25%) as an
emulsion and then burned in works boilers. The possibility of
processing fuel-water emulsions into industrial and domestic fuel

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The effective utilisation of fuels...   S/846/62/019/000/006/008
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gases is mentioned; in this case the water becomes a reagent and not simply a diluent. The direct combustion of water-coal suspensions is also mentioned. The most promising method is the simultaneous combustion of fuel and the evaporation of water carried out in the same space, the mixture of steam and combustion products being used in a steam gas-turbine for the production of power.

Card 2/2

DELYAGIN, G.N.

Problems involved in burning water-coal suspensions.   Trudy IGI 19:122-130
'62.   (MIRA 16:4)
       (Combustion)   (Suspensions (Chemistry))

DAVYDOVA, I.V.; DELYAGIN, G.N.

Some properties of water-coal suspensions. Trudy IGI 19:131-137 '62.
(MIRA 16:4)

(Coal)   (Suspensions (Chemistry))

DELYAGIN, G.N.; SMIRNOVA, Z.V.

Determination of the dispersity and moisture content of water-coal
suspensions. Trudy IGI 19:138-143 '62.   (MIRA 16:8)
(Coal)   (Sedimentation analysis)   (Moisture—Measurement)

DELYAGIN, G.N.; KANTOROVICH, B.V.

New method for the continuous burning of a solid fuel. Trudy IGI 19:
178-193 '62.   (MIRA 16:4)
                              (Combustion)

DELYAGIN, G.N.; KRAMARENKO, S.S.

New method for the high-intensity burning of peat using internal combustion. Trudy IGI 19:194-199 '62.
(Peat)   (Combustion)   (MIRA 16:4)

DELYAGIN, G. N.; SMETANNIKOV, B. N.

"Experimental study of the ignition of a drop of water-coal suspension in an immobile high-temperature medium."
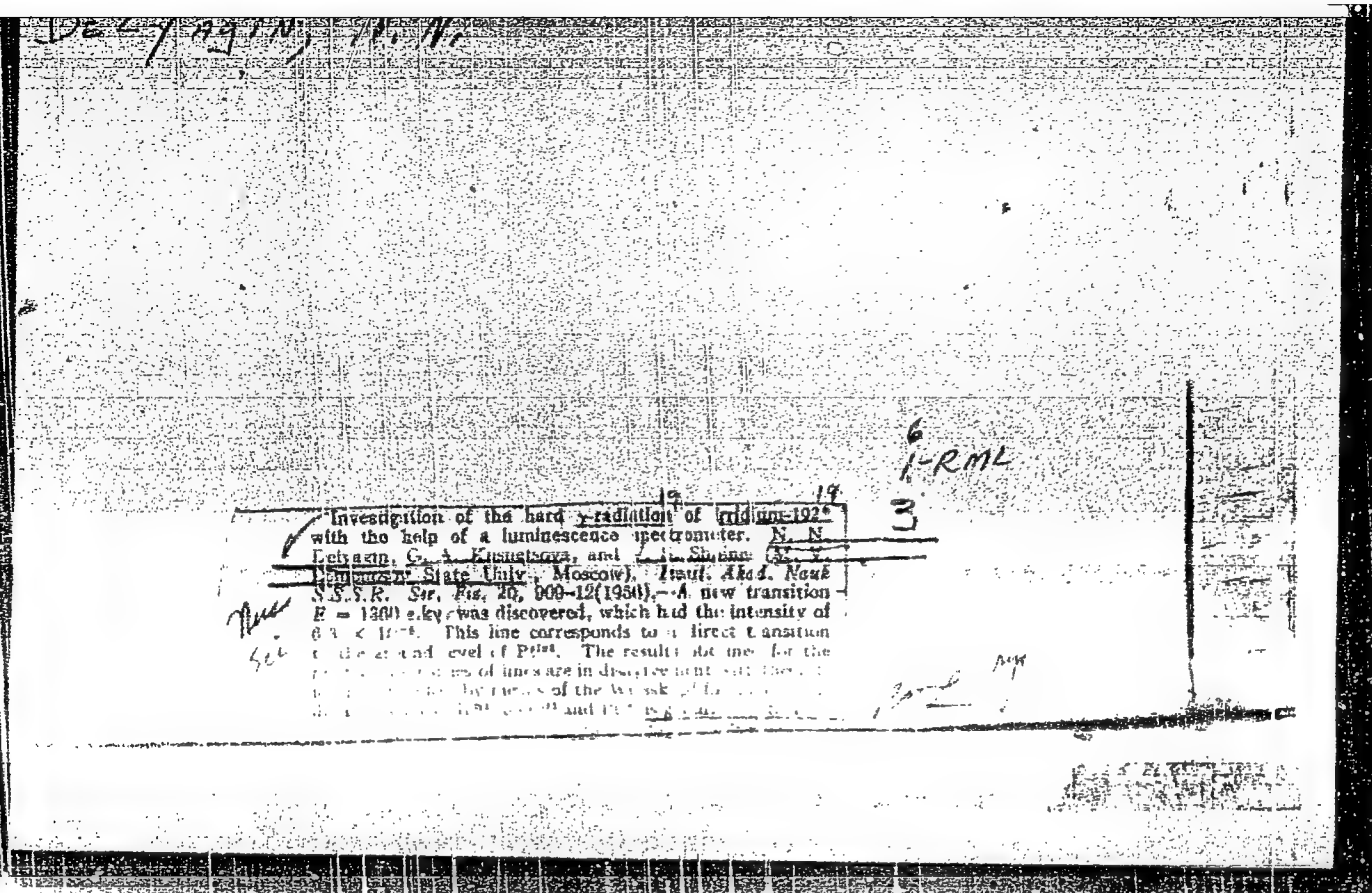
report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12 May 1964.

Inst of Combustible Minerals.

DELYAGIN, G.N.; KANTOROVICH, B.V.; KARACHENTSEV, V.I.; ONISHCHENKO, A.G.

Combustion of coal and water suspensions at a pilot plant. Ugol'
39 no.9:86-87 S '64.   (MIRA 17:10)

V-X2. BIOLOGICAL TREATMENT OF PHENOLIC WASTE WATERS FROM AN INDUSTRIAL
WORKS. Delyagin, N.N. (Vodosn. i sanit. Tekh. (Water & sanit. Engng. Moscow),
1955, (1), 25-21; LitBer. Wass. Abwass. Luft u. Boden, 1956, vol. 5, 164, 165).
During coking of hard coal, waste waters with a phenol content of 12 g per litre
are produced. This must be reduced to 0.1 g per litre before discharge of the
waste waters to the sewerage system. The phenol is extracted with butyl
acetate and the waste waters are then treated in an activated sludge plant with
domestic and other waste waters from the plant. The waste waters are mixed
in covered tanks with a retention time of 30 min. They are then aerated by
compressed air for 8 hours and settled for about 1 hour. The treated water
has a content of 0.1 mg of phenol per litre and a B.O.D. of 12.1 mg per litre.

H.P.

Investigation of the hard γ-radiation of iridium-192 with the help of a luminescence spectrometer. N. N. Delyagin, G. A. Kuznetsova, and L. L. Shunie (State Univ., Moscow). *Izvest. Akad. Nauk S.S.S.R., Ser. Fiz.* 20, 900–12(1956).—A new transition $E = 1300$ e.kv. was discovered, which had the intensity of 6.3×10^{-5}. This line corresponds to a direct transition to the ground level of Pt^{192}. The results obtained for the γ-radiation spectrum of lines are in disagreement with those obtained by means of the β-rays of the Wrosk γ-radiation and the β-ray method.

DELYAGIN, N.N.

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THE DECAY SCHEME OF Zr^{91} AND Nb^{91}. N. N. Delyagin, A. A. Sorokin, N. B. Ferafontov, and V. S. Shpinel. (Lomonosov Moscow State Univ.). Izvest. Akad. Nauk S.S.S.R. Ser. Fiz. 20, 913-24(1956) Aug. (in Russian)

During the conference on Nuclear Spectroscopy in 1955, a report was made describing the studies of Zr^{91} and Nb^{91} decay scheme which had been investigated by the method of $\beta-\gamma$ and $\gamma-\gamma$ coincidences. The method permitted the separation of the soft β spectra for Zr^{91} and Nb^{91} from the total β spectra of Zr^{91} + Nb^{91}, and revealed the $\gamma-\gamma$ coincidence with the intensity $\varkappa \approx 10\%$. The energy of cascade quanta, evaluated by the absorption method was found to be ~0.1 Mev and 3 Mev. To obtain a more accurate result the work has been repeated and measurements checked on improved apparatus and the results of the work are given. (R.V.J.)

4208. PURIFICATION OF PHENOLIC EFFLUENTS FROM GAS PLANTS.
Delyagin, N. M. (Gaz. Prom. (Gas. Ind., Moscow), 1956, (7), 15-1)) abstr. in
Chem. Abstr., 1955, vol. 50, 1738d). Extractive recovery of phenol from gas
works effluents is considered to be of doubtful economy unless concentrations
are higher than 2 g/. Since most wastes of the kind carry from 1.5 to 2 as
a maximum, destructive disposal of the contaminant, preferably by biological
oxidation, is indicated. A general description of the layout and operation
of a biological purification plant for phenol removal is illustrated with flow
sheets of the preliminary treatment and the biological processes. The main
features of the latter is an agitated aeration tank in which oxidation is
effected with the aid of microorganisms brought by recycled activated muds
and promoted by the addition of phosphoric acid. For optimum is in the
aerator is 6-8; temperature 20°. Concentrations of hydrogen sulphide must
not be greater than 0.3-0.5 p.p.m.
                                                                    C.A.

ABSTRACT: As is well known even-even nuclei as a rule have in their ground
            state the spin 0 and positive parity (characteristic 0+), and in
            their first excited state they have the spin 2 and positive parity
            (characteristic 2+). But there is no such general rule for the
            secondexcited states, where characterists 4+, 2+, and also others
            are found. If the sequence of the characteristics 0+-2+-4+
            (corresponding to the ground state and the first two excited
            states) can be successfully explained (at least within the domain
            of highly deformed nuclei), the sequence 0+-2+-2+ cannot be satis-
            factorily explained at present. It is interesting to investigate
            the experimental data on the nuclei at present known with such a
            sequence of characteristics.
            Fe^{56}, Zn^{66}, Se^{76}, Kr^{84}, Cd^{110}, Sn^{116}, Te^{122}, Te^{126}, Xe^{126}, Xe^{128},
            Os^{186}, P^{188}, Pt^{192}, Pt^{194}, Hg^{198}, Hg^{200}.
            The nuclei with $Z > 36$ are grouped in close proximity of the
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On the even Nuclei having the Characteristic 2+   PA – 2692
for the secon Excited State.

values $Z = 50$ and $Z = 82$ at which the normal proton shells are filled
up. Such a distribution of these nuclei may be connected with their
deformation. As the parameters of the deformation of these nuclei
arenot known, $\delta = (\Delta Z + \Delta N)/2$ is taken as relative measure of nu-
clear deformation. Here ΔZ denotes the absolute value of the
difference between the Z of the nucleus and that value of Z which
is nearest to it (which corresponds to the filled shell). For all
nuclei investigated here $4 \leqslant \delta \leqslant 12$ can be applied. This interval
probably corresponds to nuclei with average deformation, and ex-
citation is probably vibrationlike. The nes distribution of the
intensities of the two competing γ transitions in favor of direct
transition with increasing δ can be explained by means of an in-
crease of the contribution made by the component E 2 to a mixed
transition with increasing deformation. (1 illustration)

ASSOCIATION: Moscow State University.
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress.
Card 2/2

AUTHORS: Delyagin, N. N., Shpinel', V. S.   SOV/48-22-7-20/26

TITLE: Life of the First Excited State of the Mg^{24}-Nucleus
              (Vremya zhizni pervogo vozbuzhdennogo sostoyaniya yadra Mg^{24}.)

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya fizicheskaya, 1958, Vol.
              22, Nr 7, pp. 861-866 (USSR)

ABSTRACT: The life of the first excited state (1,37 MeV) of the Mg^{24}-
              nucleus was measured by means of the resonance scattering of γ -
              quanta. A source of gaseous Na^{24} was used. At first the theory
              underlying this method is exposed. In order to increase the
              energy of the incident quanta up to the resonance level the
              method of cascade transitions (Ref 8) was used. Formula (3) :
              $v > E_0/Mc$ gives the condition the quanta must comply with, if
              they are to have an energy sufficient for a resonance excitation.
              (E_0 denotes the quantum energy, and M the nuclear mass). The
              computation of the effective cross-section leads to the com-
              putation of the micro-spectrum of the incident quanta as re-
              presented by the function $f(E)$. In the decay scheme of

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Life of the First Excited State of the Mg^{24}-Nucleus

$Na^{24} \rightarrow Mg^{24}$ the quantum with 1,37 MeV is preceded by a quantum 2,75 MeV and by a β-radiation with a maximum energy of 1,39 MeV. Thus the condition (3) is superfulfilled. The indeterminacy introduced by the selection of a variant of the theory of β-decay is taken into account in the computation of the effective cross-section of resonance scattering according to formula (4), which gives formula (5): $\sigma = \dfrac{(1,93 \pm 0,04) \cdot 10^{-38}}{\tau}$, τ denoting the life of the 1,37 MeV state of the Mg^{24}-nucleus. The influence of the state of aggregation of the source substance is examined. It appears that the above results only hold, when the recoil nuclei have a sufficiently long time of free flight. This is achieved by using a gaseous source. The experimental procedure is described. The scattered γ-quanta are recorded by a NaJ(Tl)-crystal and a photomultiplier. The pulses coming from the latter are amplified and then led into a differential discriminator. The resonance scattering of the γ-quanta was measured at five different temperatures of the source ranging from 800 to 880°. The counting rate of the scattered quanta at 860° amounted to 22 pulses per minute on an average, which

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Life of the First Excited State of the Mg^{24}-Nucleus   SOV/48-22-7-20/26

is 10 - 15% of the total counting rate. The measured effective cross-section of resonance scattering, when computed according to formula (8), is $(1.14 \pm 0.26) \cdot 10^{-26}$ cm^2. The life of the first excited state of Mg^{24} obtained with formula (5), is $\tau = (1.7 \pm 0.4) \cdot 10^{-12}$ sec. The deformation parameter β of the Mg^{24}-nucleus is computed according to formula (11) from reference 15, $\beta = 0.59$ being obtained. There are 3 figures and 15 references, 6 of which are Soviet.

ASSOCIATION: Moskovskiy gos. universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

Card 3/3

AUTHORS: Delyagin, N. N., Shpinel', V. S.

TITLE: The Resonance Scattering of Gamma-Quanta on Nuclei of Mg^{24}

(Rezonansnoye rasseyaniye gamma-kvantov na yadrakh Mg^{24})

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 4, pp 621-622 (USSR)

ABSTRACT: This paper investigates the resonance scattering of γ-quanta (which were generated by the decay $Na^{24} \rightarrow Mg^{24}$) on Mg^{24} nuclei in order to measure the life of the first excited state (with the energy 1,37 MeV) of the Mg^{24} nucleus. In the emission and in the absorption, a part of the energy of the quantum is spent for the recoil of the nuclei. This energy loss is relatively low, but it is much higher than the width of the excited level. In order to bring about the resonance scattering, the energy of the quanta must be restored to the former value of the resonance energy. In the investigated case such a completion occurs because of a β-γ cascade (which preceded the emission of a quantum of 1,37 MeV) in the decay

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The Resonance Scattering of Gamma-Quanta on Nuclei of Mg^{24}

scheme of Na^{24}. After the emission of the β-particle and of the first γ-quantum, (275 MeV), the excited nucleus Na^{24} begins to move, and the quantum of 137 MeV is emitted already by the moving nucleus. Therefore the energy of the quantum is changed according to Doppler's law. Therefore, the energy is recompleted for a certain part of the γ-quanta. For putting this mechanism into operation the free length of path of the recoil nuclei must be sufficiently high. This condition is satisfied only in a gaseous source, and therefore the author used vapors of radioactive sodium as a source. An explicit formula is given for the cross section of the resonance scattering. The form of the micro-spectrum will depend on the variant of the theory of the β-decay. There is a certain indefiniteness (only a few per cents) in the calculation of the cross section since this variant is not known. A diagram demonstrates the microspectrum of the incident quanta for the scalar variant of the theory of the β-decay. The width (and therefore also the life) of the level is found by a comparison of the measured cross section with the calculated one. The measuring apparatus was described in a previous paper. The resonance effect was intensified by

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The Resonance Scattering of Gamma-Quanta on Nuclei of Mg^{24} SOV/2o-121-4-13/54

an increase of the temperature. The measured dependence of the effect on the temperature agrees correctly with the theoretically calculated dependence. The measured cross section of the resonance scattering was equal to $(1,14\pm0,23).10^{-26}$ cm^2 and this gives the value $\tau = (1,7 \pm 0,4).10^{-24}$ sec for the lifetime of the excited (1,37 MeV) state of Mg^{24}. For the quadrupole moment and the deformation parameter the values 0,7 barn and $\beta = 0,59$ were found. There are 1 figure and 5 references, 2 of which are Soviet.

PRESENTED: March 18, 1958, by D. V. Skobel'tsyn, Academician
SUBMITTED: March 11, 1958

Card 3/3

DELYAGIN, Nikolay Nikitich; LAZEBNIK, L.Ye., red.; KLEYMENOVA, K.F.,
vedushchiy red.; FEDOTOVA, I.G., tekhn.red.

[Tarwater control at gas producer plants] Vodosmolianoe
khoziaistvo gazogeneratornykh stantsii; opyt ekspluatatsii.
Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi
lit-ry, 1959. 86 p.
                                                    (MIRA 12:10)
   (Water--Purification) (Gas manufacture and works)

03/13/2001   CIA-RDP86-00513R000510010004-0

24(5)
AUTHORS: Delyagin, N. N., Preysa, M.

TITLE: SOV/56-36-5-55/76

The M1-transition in the V^{51}-Nucleus and the
"Seniority" Quantum Number (M1-perekhod v yadre V^{51}
i kvantovoye chislo "starshinstvo")

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
Vol 36, Nr 5, pp 1586-1587 (USSR)

ABSTRACT: Neudachin (Ref 1) already measured the M1-transition
probability in nuclei with a closed $1f_{7/2}$ shell, and he
pointed out the close connection existing with the problem
of the accuracy of the quantum number v (seniority). In
the present "Letter to the Editor" the authors give a
report about investigations carried out with V^{51}, which are
intended to show whether v is a good quantum number or not.
V^{51} has a closed neutron shell (N=28) and three protons in
the outer shell (Z=20). The configuration in the ground

Card 1/3   state: $(f_{7/2})^3_{7/2}$, v = 1; first excited state:

$(321 \text{ kev})-(f_{7/2})^3{}_{5/2}$, v=3. The M1-transition (321 kev)
would thus be connected with a variation of v (Δv = 2),
and would have to be forbidden if v were a good quantum
number. This is investigated experimentally by measuring
the lifetime of the 321 kev state by emloying the method
of the resonance scattering of γ-quanta. As a γ-source,
Cr^{51} (in $CrCl_2O_2$) was used. By means of a scintillation
spectrometer the radiation scattered on V_2O_5 and (for
comparison) on Cr_2O_3 is investigated. The measuring
method and the evaluation of results are the same as in
references 2 - 4. For the life time of the 321 kev-level
of V^{51} $\tau = (3.1\pm0.8).10^{-10}$ sec was obtained. This
corresponds to a $\overline{M}$1-transition, mixed with E2 (3.4.10 sec).
Thus it is shown that a M1-transition with respect to v is
not rigorously forbidden, and that the nuclear model used
by Neudachin is to be considered an approximative one.

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The M1-transition in the V^{51}-Nucleus and the   SOV/56-36-5-55/76
"Seniority" Quantum Number

There are 7 references, 2 of which are Soviet.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo
universiteta (Institute of Nuclear Physics of Moscow
State University)

SUBMITTED: January 16, 1959

Card 3/3

21 (8)

AUTHOR: Delyagin, N. N.   SOV/56-37-3-40/62

TITLE: Electric Quadrupole γ-Transitions in Even-even Nuclei

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
            Vol 37, Nr 3(9), pp 849 - 851 (USSR)

ABSTRACT: The author investigates the first excited state (2^+) of even-
            even nuclei, which goes over into the ground state by an
            E2 γ-transition. The experimental data on the life-time of
            this state make it possible to calculate the transition pro-
            bability $V(E2)$ and to explain the energy dependence of this
            probability. McGowan investigated nuclei within the range
            $90 < A < 130$ in this respect, and determined the energy depen-
            dence independent of Z as amounting to $V(E2) \sim E^{-1}$. In the
            present "Letter to the Editor" the range $46(Ti) \leq A \leq 198(Pt)$ is
            investigated. For the calculation of $V(E2)$ experimental data
            of references 2 and 3 were used. For all isotopes investigated
            it was found that $V(E2)$ decreases with increasing E. For high-
            ly deformed nuclei it was found that with an increasing de-
            formation parameter the quadrupole moment and the moment of
            inertia increase, which entails an increase of $W(E2)$ and a

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Electric Quadrupole γ-Transitions in Even-even Nuclei   SOV/56-37-3-40/62

decrease of E. The energy dependence of the transition probability was found to amount to lg V(E2) = a lg E + b, where a and b are constants for the isotopes of one and the same element. In a diagram lg V is represented as a function of lg E for Cd, W, Pt, and Ru. A similar dependence holds also for Se, Pd, Cd, Te, Sm, and Dy. The value of a for these 10 elements was determined from experimental data by the method of the least squares. For Ru, Pd, Cd, Te, Sm, W, and Pt a is about -1.2 ± 0.2. The influence of the shape of the nucleus is discussed on the basis of the example of the four samarium isotopes (A = 152 and 154, deformed nuclei with rotation spectrum, and 148 and 150 no rotation spectrum). The lowest excited states of even-even nuclei in the range $150 < A < 190$ and $A > 222$ are generally considered to be rotational states. Nuclei located beyond this range are considered to be spherically symmetric, and their transitions are looked upon as quadrupole transitions. Davydov and Filippov (Ref 6), however, expressed the opinion that also outside the range mentioned the lower excited states of even-even nuclei may be considered to be rotational if axial asymmetry is assumed. There are

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Electric Quadrupole γ-Transitions in Even-even Nuclei   SOV/56-37-3-40/62

1 figure and 6 references, 1 of which is Soviet.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo
universiteta (Institute of Nuclear Physics of Moscow State
University)

SUBMITTED: April 1, 1959

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82612

DELYAGIN, N. N

S/056/60/039/001/028/029
B006/B063

24.6520

AUTHORS: Delyagin, N. N., Shpinel', V. S., Bryukhanov, V. A.,
Zvenglinskiy, B.

TITLE: The Hyperfine Structure of γ-Rays, Produced by Quadrupole
Interaction in the Crystal Lattice

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,
Vol. 39, No. 1(7), pp. 220-222

TEXT: In the introduction to this article the authors describe several
publications dealing with the above-mentioned subject. A. I. Alikhanov
and V. A. Lyubimov (Ref. 5) studied the resonance absorption of
23.8-kev gamma quanta of Sn119 nuclei. The authors themselves studied the
hyperfine structure of the 23.8-kev level of this nucleus. The hyperfine
structure is due to the interaction between the quadrupole moment of the
nucleus in the excited state and the internal electric field of the tin
crystal. Metallic Sn119m served as source, which moved relative to the
absorber. Contrary to similar experiments, the source used here

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The Hyperfine Structure of γ-Rays, Produced   S/056/60/039/001/028/029
by Quadrupole Interaction in the Crystal   B006/B063
Lattice

underwent linear acceleration within certain limits. Measurements were
carried out at the temperatures of liquid nitrogen. The X-radiation
of tin (26 kev) was almost completely absorbed by a palladium film
0.06 mm thick. The γ-quanta passing through this filter were recorded
by means of an NaI(Tl) crystal. The pulses coming from the single-
channel pulse-height analyzer were linearly phase-modulated in a radio
device, viz. simultaneously with the changes in the source velocity. The
modulated pulses were fed into a 100-channel pulse-height analyzer of the
type АИ -100 (AI-100). Each channel corresponded to a certain velocity
of the source. The measurements were made with two absorbers containing
Sn^{119}, namely, metallic tin and $SnNb_3$ alloy. The dependence of resonance
absorption on the velocity of the source for a tin specimen 20 mg/cm^2
thick is shown in the upper part of the Fig. on p. 221. The curve has
three peaks at 0 and ±1.46 mm/sec (velocity of the source). This
corresponds to a hyperfine structure of the 23.8-kev level, and is
explained by the interaction between the quadrupole moment of the nucleus
in the excited state (spin 3/2) and the electric field of the crystal.

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The Hyperfine Structure of γ-Rays, Produced
by Quadrupole Interaction in the Crystal
Lattice

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B006/B063

This interpretation is confirmed by measurements with the $SnNb_3$
absorber (30 mg/cm2), which are illustrated in the lower part of the
Fig. The spacing Δ of the components of the hyperfine structure was
$\Delta = (eQ/2)\partial^2 V/\partial z^2 = (1.15\pm0.25)\cdot10^{-7}$ev. There are 1 figure and 6
references: 2 Soviet, 2 German, and 2 US.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo
               universiteta (Institute of Nuclear Physics of Moscow
               State University)

SUBMITTED: May 25, 1960

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84972

Nuclear Zeeman Effect in Sn^{119}

S/056/60/039/003/058/058/XX
B006/B070

gamma source was a foil of white metallic tin (94% of Sn^{118}) exposed to thermal neutron irradiation in a reactor. The absorber was $SnNb_3$ in which no quadrupole splitting of the 23.8 kev level takes place according to Ref. 4. Thus, the observed hyperfine splitting of the absorption line is only a consequence of the Zeeman effect. For the measurements, the source and the absorber were cooled to nitrogen temperature. The absorber (20 mg/cm^2 $SnNb_3$) was placed between the pole pieces of a magnet producing a constant magnetic field of 12,150 oe in the absorber, and the measurements were made with and without a magnetic field. The ground level is split in two and the excited one (3/2) in four sublevels under the action of the field. 6 M1 transitions are possible between these. By changing the velocity of the source (positive and negative velocity) 12 lines must be observable. The shape of the absorption spectrum is dependent on the magnetic moments $|\mu_0|$ and $|\mu|$ of the ground and excited states of the Sn^{119} nucleus; on the relative signs of these moments; and on the quadrupole splitting Δ of the excited state. The results of the measurements are represented in a diagram

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84972

Nuclear Zeeman Effect in Sn^{119}

S/056/60/039/003/058/058/XX
B006/B070

(ordinate : counting rate; abscissa : velocity of the source and the corresponding energy shift). The distance between the hyperfine struc- ture components was determined from the spectral measurement to be $\Delta = (1.2\pm0.2).10^{-7}$ev. This is in good agreement with the value obtained in Ref. 4. From the positions of the three maxima, μ_0 was found to be $-(1.1\pm0.3)$ nuclear magnetons and the moment of the 23.8 kev level to be $\mu = + (1.9\pm0.4)$ nuclear magnetons. This value is considerably higher than that given by the single-particle model. A. I. Alikhanov and V. A. Lyubimov are mentioned. There are 1 figure and 5 references: 3 Soviet, 1 German, and 1 French.
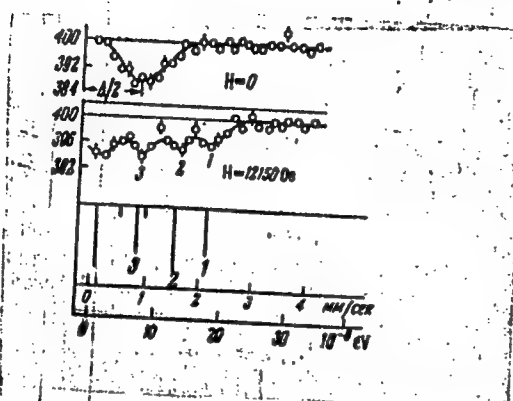
ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University)

SUBMITTED: July 4, 1960

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S/056/60/039/003/058/058/XX
B006/B070

Card 4/4

BRYUKHANOV, V.A.; DELYAGIN, N.N.; ZVENGLINSKIY, B.; SHPINEL', V.S.

Energy shift of gamma-ray transition observed in the
resonance absorbtion of γ-quanta in crystals.   Zhur.
eksp. i teor. fiz. 40 no.2:713-714 F '61.   (MIRA 14:7)

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo
universiteta.
             (Gamma rays)

SHPINEL', V.S.; BRYUKHANOV, V.A.; DELYAGIN, N.N.

Temperature effect on the hyperfine structure of gamma-radiation. Zhur. eksp. i teor. fiz. 40 no.5:1525-1527 My '61.

1. Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta.

(Gamma rays) (Spectrum, Atomic)

$24,7400 (1055,1160,1555)$

AUTHORS: Delyagin, N. N., Shpinel', V. S., Bryukhanov, V. A.

TITLE: Resonance absorption of 23.8 kev γ-quanta by Sn^{119} nuclei in crystals

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 5(11), 1961, 1347-1358

TEXT: The resonance absorption of 23.8-kev γ-quanta by Sn^{119} nuclei in SnO_2, SnO, β-Sn, and $SnNb_3$ crystals was studied. Sn^{119m} in SnO_2 was used as gamma source. The authors derived the formula

$$\varepsilon(v) = \varkappa f\left(1 - \frac{1}{\pi}\int_{-\infty}^{+\infty}\frac{\exp[-C/(1+x^2)]}{1+(x+y)^2}dx\right),\qquad (5)$$

$$x = \frac{E-E_0}{\Gamma/2},\qquad y = \frac{E_0 v/c}{\Gamma/2},\qquad C = \sigma_0 f'n.$$

which enables them to calculate the shape of the absorption spectrum measured by experiment. Γ is the total width of an absorption level, v the relative velocity between source and absorber, f' is the absorption

Card 1/6

Resonance absorption of ...

probability of a γ-quantum without recoil, n is the number of atoms on
1 cm^2 of the absorber, $\varkappa$ is a parameter determining the contribution of
the investigated γ-quanta to the overall counting rate. The line width in
the resonance absorption spectrum as a function of the thickness of the
absorber is derived from formula (5). This formula is discussed for
cases where 1) the source contains nuclei of an isotope, 2) the emission
lines are split up, the absorption lines are not split, and 3) the
absorption lines are split, too. Because of quadruple interaction, the
Sn^{119} ground state is not split (spin 1/2). Consequently the absorption
spectrum consists of two lines of equal intensity. The distance between
these two lines is

$$\Delta = \frac{1}{2}\, e^2 Q q_{zz}(1 + \frac{1}{3}\eta^2)^{1/2},$$ where Q is the nuclear

quadrupole moment, and η is a parameter of asymmetry. For a given velocity
v_o the unsplit emission line coincides with one of the two components of
the split absorption line. Resonance absorption is then

$$\varepsilon(v_0) = \varkappa f\left(1 - \frac{1}{\pi}\int_{-\infty}^{+\infty}\frac{\exp\left\{-\frac{C}{2}\left(\frac{1}{1+x^2}+\frac{1}{1+(x+y)^2}\right)\right\}}{1+x^2}dx\right),\qquad (11).$$

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Resonance absorption of ...

26688

S/056/61/041/005/003/038
B104/B108

The resonance absorption of the compounds mentioned above as a function of the velocity of the absorber relatively to the source was determined at nitrogen and room temperatures with an experimental device shown in Fig. 1. The SnO_2 source was prepared from tin enriched in the Sn^{118} isotope up to 92% and irradiated by thermal neutrons in a reactor. The absorption probability without recoil was determined from the dependence of $\mathcal{E}(v)$ on the absorber thickness. Results are given in the table. The calculation of f' is possible if the phonon spectrum of a real crystal is known. Calculation of f' in Debye approximation is discussed. F. L. Shapiro (UFN, 72, 685, 1960), V. A. Lyubimov, A. I. Alikhanov (Izv. AN SSSR, seriya fiz., 24, 1076, 1960), K. P. Mitrofanov, V. S. Shpinel' (ZhETF, 40, 983, 1961), and Yu. M. Kagan are mentioned. The authors thank N. Ye. Alekseyevskiy for valuable discussions. There are 7 figures, 1 table, and 20 references: 7 Soviet and 13 non-Soviet. The 3 most recent references to English-language publications read as follows: W. Visscher, Ann. of Physics, 9, 194, 1960; H. J. Lipkin, Ann. of Physics, 9, 332, 1960; S. De Benedetti, G. Lang, R. Ingalls, Phys. Rev. Lett., 6, 601, 1961.

Card 3/6

S/056/61/041/006/014/054
B113/B104

AUTHORS: Shpinel', V. S., Bryukhanov, V. A., Delyagin, N. N.

TITLE: Isomeric energy shifts of the 23.8-kev γ-transition in the Sn^{119} nucleus

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 6(12), 1961, 1767-1770

TEXT: The authors measured the isomeric shifts of the 23.8-kev γ-transition in the Sn^{119} nucleus in various tin compounds. An Sn$^{119m}O_2$ preparation served as source which was kept at room temperature. The absorber consisted of various crystalline tin compounds and was kept at nitrogen or room temperature. In SnF$_2$, the absorption line is split into two components due to quadrupole interaction of the excited Sn^{119} nucleus with the gradient of the electric field in the crystal. The isomeric shift δ with respect to the energy of the γ-transition in the SnO$_2$ crystal was determined at room temperature. There was no quadrupole splitting in the absorption spectrum of the SnCl$_2$ crystal. Besides in β-Sn and SnO,

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quadrupole splitting was only observed in SnF_2: $\Delta = (15.5 \pm 2.5) \cdot 10^{-8}$ ev.
Δ did not much depend on temperature. Measurements of energy shifts for
various compounds showed that there were no distinct rules governing the
isomeric shifts of the 23.8-kev γ-transition in the Sn^{119} nucleus. It
may be assumed that for bivalent compounds the two p-electrons in the
outer shell of the tin atom play a special role in the chemical bond; the
valency electrons of the following shell, the two s-electrons, affect the
chemical bond in tetravalent compounds only, and lead to a sharp change
of the isomeric shift. Hence, it follows that the density of the
s-electron wave function in the region of the nucleus is lower in
tetravalent than in bivalent compounds. Comparing the isomeric shift of
bi- and tetravalent tin compounds one may put down:

$$E_{II} - E_{IV} \sim (R_{exc}^2 - R_0^2)\left[|\Psi(0)|_{II}^2 - |\Psi(0)|_{IV}^2\right],$$ where R_{exc} and R_0 are the
effective radii of the charge of the Sn^{119} nucleus in the excited and
ground state, $\Psi(0)$ the electron wave function in the region of the
nucleus. $R_{exc}^2 > R_0^2$, i.e., the effective radius of the charge distribution
grows when the Sn^{119} nucleus is excited. Since quadrupole interaction
exists, the magic proton core of the Sn^{119} nucleus is not spherically
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Isomeric energy shifts of the ... S/056/61/041/006/014/054
B113/B104

symmetric. There are 2 figures, 1 table, and 9 references: 5 Soviet and 4 non-Soviet. The four references to English-language publications read as follows: O. C. Kistner, A. W. Sunyar. Phys. Rev. Lett., $\underline{4}$, 412, 1960; S. De Benedetti, G. Lang, R. Ingalls. Phys. Rev. Lett., $\underline{6}$, 60, 1961; I. R. Walker, G. R. Wertheim, V. Jaccarino. Phys. Rev. Lett., $\underline{6}$, 98, 1961; A. J. F. Boyle, D. St. P. Bunbury, C. Edwards. Proc. Phys. Soc., $\underline{77}$, 1062, 1961.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of the Moscow State University)

SUBMITTED: July 1, 1961

Card 3/3

S/120/62/000/001/003/061
E032/E514

AUTHORS: Bryukhanov, V.A., Delyagin, N.N., Zvenglinskiy, B.,
            Sergeyev, S.A. and Shpinel', V.S.

TITLE: Measurement of the resonance absorption spectra of
            gamma-rays in crystals

PERIODICAL: Pribory i tekhnika eksperimenta, no.1, 1962, 23-28

TEXT: In a previous paper (Ref.5: Zh.eksperim. i teor.fiz.,
1960, 39, 220; Ibid 40, 713) the authors described an apparatus
which was used to investigate the Mössbauer effect (23.8 kV
gamma-rays on Sn^{119} nuclei in crystals). In this apparatus the
relative velocity of the source and the absorber is varied
linearly with time with the aid of a mechanical device and the
intensity of the gamma-rays corresponding to different values of
this velocity is recorded with a multi-channel kicksorter and an
amplitude modulator working in synchronism with the device
producing the above velocity variation. In the present note the
authors give a more detailed description of the apparatus,
including both the mechanical and the electronic parts of it. A
typical absorption spectrum for a SnO_2 crystal (9 mg/cm^2 target
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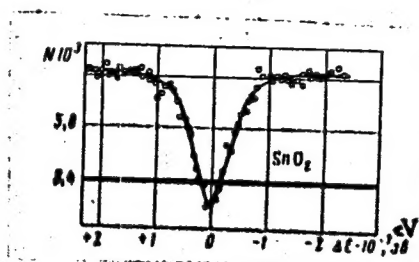Measurement of the resonance ...   S/120/62/000/001/003/061
                                      E032/E514

and 6 mg/cm^2 source, both at room temperature) is shown in Fig.6.
It is reported that the width of the 23.8 keV excited state of Sn^{119}
is $(2.6 \pm 0.25) \times 10^{-8}$ eV.   There are 6 figures.

ASSOCIATION: Institut yadernoy fiziki MGU
             (Institute of Nuclear Physics MGU)

SUBMITTED: June 15, 1961

Fig.6
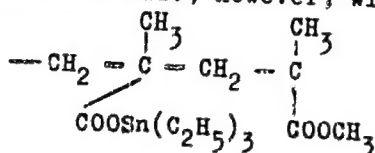

Card 2/2

S/056/62/042/002/051/055
B108/B138

AUTHORS: Bryukhanov, V. A., Gol'danskiy, V. I., Delyagin, N. N.,
             Makarov, Ye. F., Shpinel', V. S.
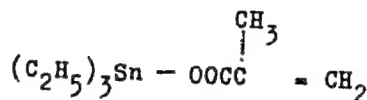
TITLE: Mössbauer effect in tin-containing polymer

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42,
             no. 2, 1962, 637-639

TEXT: Mössbauer effect in polymers is very weak because polymers usually
contain only light nuclei and have no distinct crystal structure.
Successful studies were made, however, with the tin-organic compound

$$-CH_2-\underset{\underset{COOSn(C_2H_5)_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_2-\underset{\underset{COOCH_3}{|}}{\overset{\overset{CH_3}{|}}{C}}-$$

which is the copolymer

$$(C_2H_5)_3Sn-OOC\overset{\overset{CH_3}{|}}{C}=CH_2$$

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Mössbauer effect in tin- ...   S/056/62/042/002/051/055
                                            B108/B138

in methylmetacrylate. The tin content in the transparent solid (1.2 g/cm^3) specimens was 30% by weight. The synthesis of the polymer was described earlier by M. F. Shostakovskiy et al. (ZhPKh, 31, 1434, 1958). The resonance absorption spectra (relative counting rate versus velocity of absorber relative to gamma source) have two equal lines at 0 ± 0.2 and 3.0 ± 0.2 mm/sec with a width of 0.8 mm/sec each. This width is somewhat greater than twice the natural width of the excited (23.8 kev) level of Sn^{119}. It is supposed that the observed spectrum is due to quadrupole interaction of excited S^{119} nuclei with the nonuniform electric field around the tin atoms in the molecules of the polymer. Another way of interpreting the splitting of the lines is to assume two states of the tin in the polymer molecules, which differ in the density of the orbitals at the site of the nucleus. The resonance absorption probability for gamma quanta without recoil (f') was 0.04 at $77^{\circ}K$ and about 0.017 at $195^{\circ}K$. The possibility of observing the Mössbauer effect on impurity nuclei in solid solutions is pointed out. D. A. Kochkin and Yu. M. Kagan are thanked for help and discussions. There are 1 figure and 7 references: 6 Soviet and 1 non-Soviet.

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S/056/62/042/002/051/055
B108/B138

Mössbauer effect in tin- ...

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR). Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: December 13, 1961

Card 3/3